

Set	Items	Description
S1	13661	LAPLACE OR SIGNUM OR (FAST OR DIGITAL) () FOURIER () TRANSFORM? OR FFT OR DFT OR FOURIER () TRANSFORM?
S2	20006	(DIGITAL OR ELECTRONIC) (2W) (WATERMARK? OR WATER () MARK?) OR WATERMARK? OR WATER () MARK? OR TRANSLUCENT () DESIGN?
S3	8767594	FILTER? OR LOOKUP OR LOOK () UP OR SEARCH? OR SEEK? OR QUER? OR MATCH? OR QUEST? OR PURSU? OR FIND? OR RETRIEV? OR EXTRACT? OR SEPARATE? OR DIFFERENTIAT? OR SCREEN? OR PREFILTER? OR PR- E () FILTER?
S4	4866795	DETECT? OR DETERMIN? OR DECID? OR RESOLV? OR ASCERTAIN? OR RECOGNI?
S5	36	S1 (S) S2
S6	11	S5 (S) S3
S7	0	S6 (S) S4
S8	36	S5 OR S6
S9	0	S8 NOT PY>1995
File	15:ABI/Inform(R)	1971-2004/Aug 12 (c) 2004 ProQuest Info&Learning
File	810:Business Wire	1986-1999/Feb 28 (c) 1999 Business Wire
File	647:CMP Computer Fulltext	1988-2004/Aug W1 (c) 2004 CMP Media, LLC
File	275:Gale Group Computer DB(TM)	1983-2004/Aug 12 (c) 2004 The Gale Group
File	674:Computer News Fulltext	1989-2004/Jul W4 (c) 2004 IDG Communications
File	696:DIALOG Telecom. Newsletters	1995-2004/Aug 11 (c) 2004 The Dialog Corp.
File	621:Gale Group New Prod. Annou. (R)	1985-2004/Aug 12 (c) 2004 The Gale Group
File	636:Gale Group Newsletter DB(TM)	1987-2004/Aug 12 (c) 2004 The Gale Group
File	813:PR Newswire	1987-1999/Apr 30 (c) 1999 PR Newswire Association Inc
File	613:PR Newswire	1999-2004/Aug 12 (c) 2004 PR Newswire Association Inc
File	16:Gale Group PROMT(R)	1990-2004/Aug 12 (c) 2004 The Gale Group
File	160:Gale Group PROMT(R)	1972-1989 (c) 1999 The Gale Group
File	553:Wilson Bus. Abs. FullText	1982-2004/Jul (c) 2004 The HW Wilson Co

US-PAT-NO: 5488664
 DOCUMENT-IDENTIFIER: US 5488664 A
 TITLE: Method and apparatus for protecting visual information with printed cryptographic watermarks

----- KWIC -----

US Patent No. - PN (1):
 5488664

Brief Summary Text - BSTX (10):

The purpose of the invention is to produce a printed watermark which provides reasonable security against unauthorized access to and modification of visual information at very low costs. The cryptographic printed watermark of the invention can be produced by standard laser or ink-jet printers and verified directly by the human visual system without using any cryptographic knowledge, computational devices or chemical processes. The watermark consists of an array of printed shapes which appears to be random, and the device consists of another array of printed shapes, which also appears to be random, printed on a transparent medium. When the transparent developer is placed over the printed watermark, a hidden image becomes clearly visible.

Detailed Description Text - DETX (2):

With reference to the drawings which illustrate a typical watermarking developer and various pixels and subpixels, FIG. 1a illustrates an array of subpixels forming a typical printed watermark and FIG. 1b illustrates an array of subpixels forming a typical printed developer. The hidden image is completely invisible in each of the two arrays. If FIG. 1b is photocopied onto a transparency 2 and then placed on top of and aligned with sheet 4 of the watermark printed thereon, FIG. 1a, as shown in FIG. 1c, a viewer looking through FIG. 1b of the transparency, illustrating the developer, onto the watermark, sees the hidden image of a circle 6, which is the image encoded in the apparently random array of shapes that makes up FIGS. 1a and 1b. The subpixels of the arrays of FIGS. 1a and 1b are rectangles each composed of two black subpixels and two white subpixels.

Detailed Description Text - DETX (8):

Another embodiment of the invention allows images to be concealed. For example, a first sheet of material may be printed with an image of, for example, a house. A second transparent sheet of material may be printed with an image of, for example, a dog. The developer (transparency) image may be superimposed on the watermark image of the house and a hidden image then be seen with no trace of either the house or the dog being visible. To construct such a scheme, a more complex collection of 2.times.2 subpixel subarrays is used, as shown in FIGS. 4a to 4l. In the individual image subarrays having two black subpixels are considered to be white and subarrays having three black subpixels are considered to be black. In the superimposed image, subarrays having three black subpixels are considered to be white.



United States Patent [15]

[11] Patent Number: 5,488,664
 [45] Date of Patent: Jan. 30, 1996

[54] METHOD AND APPARATUS FOR PROTECTING VISUAL INFORMATION WITH PRINTED CRYPTOGRAPHIC WATERMARKS

943691 10/1993 United Kingdom
 950976 6/1994 United Kingdom
 913820 10/1995 United Kingdom

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[21] Appl. No: 251,933

[22] Filed: Apr. 23, 1994

[51] Int. Cl. G09C 5/00

[52] U.S. Cl. 380/24; 380/25; 380/26; 380/27; 380/28; 380/29; 380/30; 380/31; 380/32; 380/33; 380/34; 380/35; 380/36; 380/37; 380/38; 380/39; 380/40; 380/41; 380/42; 380/43; 380/44; 380/45; 380/46; 380/47; 380/48; 380/49; 380/50; 380/51; 380/52; 380/53; 380/54; 380/55; 380/56; 380/57; 380/58; 380/59; 380/60; 380/61; 380/62; 380/63; 380/64; 380/65; 380/66; 380/67; 380/68; 380/69; 380/70; 380/71; 380/72; 380/73; 380/74; 380/75; 380/76; 380/77; 380/78; 380/79; 380/80; 380/81; 380/82; 380/83; 380/84; 380/85; 380/86; 380/87; 380/88; 380/89; 380/90; 380/91; 380/92; 380/93; 380/94; 380/95; 380/96; 380/97; 380/98; 380/99; 380/100

[58] Field of Search: 380/24, 4, 23, 51, 380/34, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100

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PAT-NO: 6647130
 UMENT-IDENTIFIER: US 6647130 B2
 LE: Printable interfaces and digital linking with emb
 codes

----- KWIC -----

tract Text - ABTX (1):

A physical medium is encoded with machine readable information that p
 uman interface to a computer system. The information encoded into the
 um indicates a computer implemented process, and is encoded according
 etral encoding scheme, such as encoding by modifying color values of
 phic or other image printed on the medium. For example, a digital wat
 other steganographic data hidden in the image indicates a web page.
 pponse to the user selecting the encoded information area, the machine
 dable information is decoded, and used to invoke a computer implement
 cess.

ailed Description Text - DETX (271):

A major improvement to the nominal knot pattern system previously desc
 ectly addresses practical difficulties (1), the inefficient covering,
 unwanted visibility of the rings, and (6) the need for higher levels
 urity. This improvement also indirectly address item (4) the overlap
 ue, which has been discussed in the last paragraph. This major improv
 the following: just prior to the step where the mosaic of the encoded
 terns is added to an original image to produce a distributable image,
 aic of encoded knot patterns, 866, is spatially filtered (using commo
 techniques) by a standardized and (generally smoothly) random phase-
 tial filter. It is very important to note that this phase-only filter
 elf fully rotationally symmetric within the spatial frequency domain,
 filtering effects are fully rotationally symmetric. The effect of th
 se-only filter on an individual luminous ring is to transform it into
 pthly varying pattern of concentric rings, not totally dissimilar to
 tern on water several instances after a pebble is dropped in, only the
 e patterns are somewhat random in the case of this phase-only filter
 n the uniform periodicity of a pebble wave pattern. FIG. 20 attempt
 e a rough (i.e. non-greyscale) depiction of these phase-only filtered
 terns. The top figure of FIG. 20 is a cross section of a typical brig
 our/profile 874 of one of these phase-only filtered ring patterns.
 erenced in the figure is the nominal location of the pre-filtered oute
 ter, 870. The center of an individual ring, 872, is referenced as the
 und which the brightness profile is rotated in order to fully describ
 dimensional brightness distribution of one of these filtered patterns
 ther rough attempt to communicate the characteristics of the filtered
 depicted as 876, a crude greyscale image of the filtered ring. This
 se-only filtered ring, 876 will can be referred to as a random ripple
 tern.

US 6647130 B2

(32) United States Patent
 Rhoads

(10) Patent No.: US 6,647,130 B2
 (45) Date of Patent: Nov. 11, 2003

(54) PRINTABLE INTERFACES AND DIGITAL
 LINKING WITH EMBEDDED CODES

(56) Field of Search: 382/100, 112,
 382/135, 284, 389/9, 28, 448, 450, 380/54,
 221-234, 287, 288/74, 75, 53, 94, 113,
 502; 348/472, 1; 235/484, 340/523, 5.6
 5.65, 5.8, 5.81, 5.82, 356/7; 902/1, 4,
 6, 713/74; 385/94, 705/1, 44, 345/760,
 703, 704, 817, 838, 709/10, 104, 1, 311,
 513; 709/200, 217-219, 227, 230, 245,
 250, 325, 328, 329

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(*) Notice: Subject to any disclaimer, the term of this
 patent is extended or adjusted under 35
 U.S.C. 154(b) by 0 days.

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 Jan. 1995.

(List continued on next page.)

(21) Appl. No.: 187,891,87

(22) Filed: Jul. 1, 2002

(45) Prior Publication Data

US 2002/0031541 A1 Feb. 13, 2003

Related U.S. Application Data

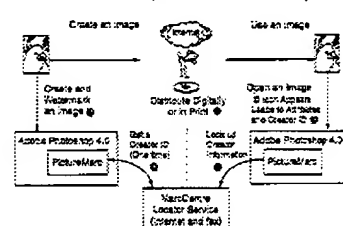
(53) Continuation of application No. 09/812,377, filed on Jul. 6,
 2000, which is a continuation of application No. 08/746,615,
 filed on Nov. 12, 1996, now Pat. No. 6,122,423, which is a
 continuation-in-part of application No. 08/949,415, filed on
 May 15, 1998, now Pat. No. 6,350,246, and a continuation-in-
 part of application No. 08/700,083, filed on Dec. 27, 1995,
 now Pat. No. 5,941,978, which is a continuation-in-part of
 application No. 08/430,796, filed on May 4, 1995, now Pat.
 No. 5,516,223, and a continuation-in-part of application No.
 08/327,626, filed on Oct. 21, 1994, now Pat. No. 5,795,426,
 and a continuation-in-part of application No. 08/023,289,
 filed on Jan. 17, 1994, now abandoned, and application No.
 08/527,421, filed on Oct. 21, 1994, is a continuation-in-part
 of application No. 08/023,289, filed on Jan. 17, 1994, now
 abandoned, which is a continuation-in-part of application
 No. 08/134,486, filed on Nov. 18, 1994, now abandoned.

(51) Int. Cl. H04M 1/00

(52) U.S. Cl. 382/180

ABSTRACT

A physical medium is encoded with machine readable
 information that provides a human interface to a computer
 system. The information encoded into the medium indicates
 a computer implemented process, and is encoded according
 to a spectral encoding scheme, such as encoding by mod-
 ifying color values of a graphic or other image printed on the
 medium. For example, a digital watermark or other stega-
 nographic data hidden in the image indicates a web page. In
 response to the user selecting the encoded information area,
 the machine readable information is decoded, and used to
 invoke a computer implemented process.



5768,426 572336

DERWENT-ACC-NO: 2982-391429

DERWENT-WEEK: 200417

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TITLE: A method to embed and extract hidden digital watermark to protect the copyright of the original image embedding the watermarked image to the original through clockwise and counterclockwise DCT transformations

INVENTOR: SHIU, C; WU, J; HSU, C

PATENT-ASSIGNEE: CYBERLINK CORP[CYBEN]

PRIORITY-DATE: 1999TW-0112076 (July 16, 1999)

PATENT-FAMILY:

PUB-NO	PUB-DATE	LANGUAGE	EP
US 6700991 B1	March 2, 2004	N/A	00
TW 451171 A	August 21, 2001	N/A	00

APPLICATION-DATE:

PUB-NO	APPL-DESCRIPTOR	APPL-NO	EP
US 6700991B1	N/A	2000US-0520058	00
TW 451171A	N/A	1999TW-0112076	00

INT-CL (IPC): G06K009/00, G06K009/46, G09C005/00

ABSTRACTED-PUB-NO: TW 451171A

BASIC-ABSTRACT:

NOVELTY - This invention discloses a method to embed hidden digital watermark. The method includes the following: an original image and a watermark image are provided. A scattered watermarked image is produced by randomly sorting the watermarked image. Then, the original image and the scattered watermarked image are sorted on the base of section to generate multiple original sections and the watermarked sections corresponding to the original sections through a determined sorting approach. The original image sections are DCT transformed clockwise to convert the sections to DCT coefficient sections corresponding to different frequency ranges. The watermark sections are embedded to the DCT coefficient sections of the original image sections within the determined frequency range to generate multiple combined DCT coefficient sections. Then, the combined DCT coefficient sections are transformed counterclockwise to produce an image with embedded watermark to protect the copyright of the original image.

CHOSEN-DRAWING: Dwg.1/1

TITLE-TERMS: METHOD EMBED EXTRACT HIDE DIGITAL WATERMARK PROTECT ORIGINAL IMAGE EMBED WATERMARK IMAGE ORIGINAL IMAGE THROUGH CLOCKWISE DCT TRANSFORM

Details Text Image HTML FULL



United States Patent

Wu et al.

(10) Patent No.: US 6,700,991 B1
(45) Date of Patent: Mar. 2, 2004

(54) HIDDEN DIGITAL WATERMARKS IN IMAGES

(75) Inventor: Je-Ling Wu, Taipei (TW); Chiu-Ting Hsu, Taipei (TW)

(73) Assignee: Cyberlink Corporation, Taipei (TW)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 156(a) by 0 days.

(21) Appl. No.: 09/520,058

(22) Filed: Mar. 7, 2000

(30) Foreign Application Priority Data

No. 16, 1999 (TW) 8512076 A

(31) Int. Cl. G06K 9/00, G06K 9/46

(32) U.S. Cl. 382/108, 382/250

(33) Field of Search 382/102, 250

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Primary Examiner—Leo Soudan

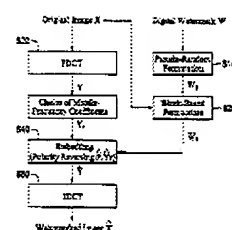
Assistant Examiner—Thomas Alcorn

(74) Attorney, Agent, or Firm—Fitz & Richardson P.C.

(57) ABSTRACT

An image authentication method by embedding digital watermark into images, comprising providing an original image and a watermark image, applying pseudo-random permutations to the watermark image for generating a dispersed watermark image; applying block-based permutations to the original image and the dispersed watermark image in order to form a plurality of original image blocks with each of the watermark blocks dispersed over the corresponding image block only; applying FDCT (Forward Discrete Cosine Transform) on each of the original image blocks independently so that each of the original image blocks is transformed into a DCT coefficient block that corresponds to different frequency ranges; embedding said watermark image blocks into said DCT coefficient blocks, in order to form a plurality of combined DCT coefficient blocks; applying IDCT (Inverse Discrete Cosine Transform) to the combined DCT coefficient blocks to form an embedded watermark image.

10 Claims, 9 Drawing Sheets

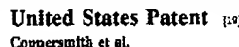


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----- KWIC -----

A visible seal or label containing a serial number is placed in package on the product packaging. The visible label contains the serial number as a first public key encrypted version of the serial number. A second hidden label inside of the package has thereon a second a second encrypted version of the serial number made using a second public key. The hidden label may be secured inside of the package out of sight or may be placed on one of the visible label and therefore viewable through a transparent case, opened or visible when peeled off. The private keys are known only to the manufacturer. Using a corresponding public key provided by the manufacturer, the consumer, law enforcement agent, or customs inspector can verify if the encrypted version matches the serial number. An advantage to this method is that only the manufacturer can produce matching pairs. Moreover, use of a sale machine equipped with the public key the sales clerk can authenticate the product in front of the consumer at point of purchase. Additionally, in the case of a CD or other digital medium, the hidden label may contain a digital watermark of the encrypted serial number such that a consumer, law enforcement agency, or customs inspector can readily detect a counterfeit product.

US Patent No. - PN (1) :
6069955



(11) Patent Number: 6,069,955
(35) Date of Patent: May 30, 2000

- [54] SYSTEM FOR PROTECTION OF GOODS
AGAINST COUNTERFEITING
- [75] Inventor: Don Coppentrith, Ossining, Claude A. Greenblatt, Chappaqua, Charles P. Tresser, Macartneyville, Chalm W. Wainwright, all of N.Y.
- [73] Assignee: International Business Machines Corporation, Armonk, N.Y.
- [21] Appl. No.: 09,060,026
- [22] Filed: Apr. 14, 1996
- [21] Int. Cl.⁷: G06C 2/00; H04N 5/00
- [52] U.S. Cl.: 380/24; 382/200; 382/201; 382/202; 382/203; 382/204; 382/205; 382/206; 382/207; 382/208; 382/209; 382/210; 382/211; 382/212; 382/213; 382/214; 382/215; 382/216; 382/217; 382/218; 382/219; 382/220; 382/221; 382/222; 382/223; 382/224; 382/225; 382/226; 382/227; 382/228; 382/229; 382/230; 382/231; 382/232; 382/233; 382/234; 382/235; 382/236; 382/237; 382/238; 382/239; 382/240; 382/241; 382/242; 382/243; 382/244; 382/245; 382/246; 382/247; 382/248; 382/249; 382/250; 382/251; 382/252; 382/253; 382/254; 382/255; 382/256; 382/257; 382/258; 382/259; 382/260; 382/261; 382/262; 382/263; 382/264; 382/265; 382/266; 382/267; 382/268; 382/269; 382/270; 382/271; 382/272; 382/273; 382/274; 382/275; 382/276; 382/277; 382/278; 382/279; 382/280; 382/281; 382/282; 382/283; 382/284; 382/285; 382/286; 382/287; 382/288; 382/289; 382/290; 382/291; 382/292; 382/293; 382/294; 382/295; 382/296; 382/297; 382/298; 382/299; 382/300; 382/301; 382/302; 382/303; 382/304; 382/305; 382/306; 382/307; 382/308; 382/309; 382/310; 382/311; 382/312; 382/313; 382/314; 382/315; 382/316; 382/317; 382/318; 382/319; 382/320; 382/321; 382/322; 382/323; 382/324; 382/325; 382/326; 382/327; 382/328; 382/329; 382/330; 382/331; 382/332; 382/333; 382/334; 382/335; 382/336; 382/337; 382/338; 382/339; 382/340; 382/341; 382/342; 382/343; 382/344; 382/345; 382/346; 382/347; 382/348; 382/349; 382/350; 382/351; 382/352; 382/353; 382/354; 382/355; 382/356; 382/357; 382/358; 382/359; 382/360; 382/361; 382/362; 382/363; 382/364; 382/365; 382/366; 382/367; 382/368; 382/369; 382/370; 382/371; 382/372; 382/373; 382/374; 382/375; 382/376; 382/377; 382/378; 382/379; 382/380; 382/381; 382/382; 382/383; 382/384; 382/385; 382/386; 382/387; 382/388; 382/389; 382/390; 382/391; 382/392; 382/393; 382/394; 382/395; 382/396; 382/397; 382/398; 382/399; 382/400; 382/401; 382/402; 382/403; 382/404; 382/405; 382/406; 382/407; 382/408; 382/409; 382/410; 382/411; 382/412; 382/413; 382/414; 382/415; 382/416; 382/417; 382/418; 382/419; 382/420; 382/421; 382/422; 382/423; 382/424; 382/425; 382/426; 382/427; 382/428; 382/429; 382/430; 382/431; 382/432; 382/433; 382/434; 382/435; 382/436; 382/437; 382/438; 382/439; 382/440; 382/441; 382/442; 382/443; 382/444; 382/445; 382/446; 382/447; 382/448; 382/449; 382/450; 382/451; 382/452; 382/453; 382/454; 382/455; 382/456; 382/457; 382/458; 382/459; 382/460; 382/461; 382/462; 382/463; 382/464; 382/465; 382/466; 382/467; 382/468; 382/469; 382/470; 382/471; 382/472; 382/473; 382/474; 382/475; 382/476; 382/477; 382/478; 382/479; 382/480; 382/481; 382/482; 382/483; 382/484; 382/485; 382/486; 382/487; 382/488; 382/489; 382/490; 382/491; 382/492; 382/493; 382/494; 382/495; 382/496; 382/497; 382/498; 382/499; 382/500; 382/501; 382/502; 382/503; 382/504; 382/505; 382/506; 382/507; 382/508; 382/509; 382/510; 382/511; 382/512; 382/513; 382/514; 382/515; 382/516; 382/517; 382/518; 382/519; 382/520; 382/521; 382/522; 382/523; 382/524; 382/525; 382/526; 382/527; 382/528; 382/529; 382/530; 382/531; 382/532; 382/533; 382/534; 382/535; 382/536; 382/537; 382/538; 382/539; 382/540; 382/541; 382/542; 382/543; 382/544; 382/545; 382/546; 382/547; 382/548; 382/549; 382/550; 382/551; 382/552; 382/553; 382/554; 382/555; 382/556; 382/557; 382/558; 382/559; 382/560; 382/561; 382/562; 382/563; 382/564; 382/565; 382/566; 382/567; 382/568; 382/569; 382/570; 382/571; 382/572; 382/573; 382/574; 382/575; 382/576; 382/577; 382/578; 382/579; 382/580; 382/581; 382/582; 382/583; 382/584; 382/585; 382/586; 382/587; 382/588; 382/589; 382/590; 382/591; 382/592; 382/593; 382/594; 382/595; 382/596; 382/597; 382/598; 382/599; 382/600; 382/601; 382/602; 382/603; 382/604; 382/605; 382/606; 382/607; 382/608; 382/609; 382/610; 382/611; 382/612; 382/613; 382/614; 382/615; 382/616; 382/617; 382/618; 382/619; 382/620; 382/621; 382/622; 382/623; 382/624; 382/625; 382/626; 382/627; 382/628; 382/629; 382/630; 382/631; 382/632; 3

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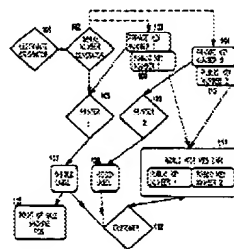
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Primary Examiner—James E. Tremblé
Assistant Examiner—Chung H. Nguyen
Attorney, Agent, or Firm—Whitney, Curtis & Whitney;
Stephen C. Kaufman, Esq.

577 ABSTRACT

A visible seal or label containing a serial number is placed on a plain view on the product packaging. The visible label contains the serial number as well as a free public key (unencrypted version of the serial number). A second or hidden label is placed on the package that contains a second unencrypted version of the serial number made using the free public key. The hidden label may be sealed inside the package out of sight or may be placed on the back of the visible label and therefore viewable through a transparent material. The hidden label contains the serial number and keys are known only to the manufacturer. Using a corresponding public key provided by the manufacturer, the consumer, law enforcement agency, or persons responsible for the investigation can verify the serial number. The use of this advantage to this method is that only the manufacturer can produce matching pairs. Moreover, using a point of sale machine equipped with the public key for the sales clerk can verify the serial number and the label is not required for purchase. Additionally, in the case of a CD or other digital medium, the hidden label may comprise a digital watermark of the unencrypted serial number such that a consumer, law enforcement agency, or customs official can readily detect the serial number.

17 Clothing & Drawing Shapes

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L Number	Hits	Search Text	DB	Time stamp
1	3	(("5488664") or ("6700991") or ("6069955")).PN.	USPAT	2004/08/19 20:59
2	11	("5208857" "5323187" "5809139" "5864649" "5930369" "6185312" "6240121" "6285775" "6317767" "6373974" "6560370").PN.	USPAT	2004/08/19 20:59
3	3	6069955.URPN.	USPAT	2004/08/19 21:04
4	78	5488664.URPN.	USPAT	2004/08/19 21:20
5	45	5734752.URPN.	USPAT	2004/08/19 21:17
6	1	("5488664").PN.	USPAT	2004/08/19 21:20